Docket No.: 0171-1250PUS1
(Patent)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application of:
Yukio NAGASAKI et al.

Application No.:	10/561,152	Confirmation No.:	9582
Filed:	December 16, 2005	Art Unit:	1796
For:	DIAMINE HAVING QUINOXALINE UNIT, POLYIMIDE PRECURSOR, POLYIMIDE AND USE THEREOF	Examiner:	G. LISTVOYB

REQUEST FOR PRE-APPEAL CONFERENCE

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants request review of the final rejection in the above-identified application. No amendments are being filed with this request.

The review is being requested for the reasons set forth on the attached five (5) sheets.

ARGUMENTS IN SUPPORT OF PRE-APPEAL BRIEF REVIEW

[I] Remarks

Appellant requests withdrawal of the rejections of record as being clearly erroneous in fact and in law for the reasons set forth below.

[II] Status of Claims

Claims 3-15 are pending, and all pending claims stand rejected.

[III] Rejections To Be Reviewed

Claims 3-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamciuc et al., J of Macromolecular Sci, Part A, Vol. 37, No. 11, 2000, pp. 1407-1435 (hereinafter "Hamciuc-I") or Hamciuc et al., High performance polymers, Vol. 14, No. 1, 2002, pp. 63-75 (hereinafter "Hamciuc-II") in view of Korshak et al., Acta polymerica, Vol. 34, 1983, pp. 213-215 (hereinafter "Korshak"). Appellants respectfully traverse the rejection.

Hamciuc-I and Korshak

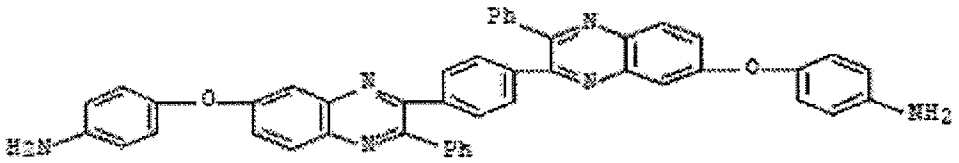
The present invention is drawn to polyimides and polyimide precursors that comprise a residue of a tetracarboxylic acid. Neither Hamciuc-I nor Korshak teaches polyimides or polyimide precursors comprising a residue of a tetracarboxylic acid.

Hamciuc-I teaches a polymer produced by the reaction of a dicarboxylic diacid chloride with a diamine. Korshak teaches a polymer produced by the reaction of a dicarboxylic diacid chloride with a diamine.

As dicarboxylic diacid chlorides are used to react with the diamines taught by Hamciuc-I and Korshak, the resulting polymer products do not contain a residue of a tetracarboxylic acid, as recited in the pending claims. Thus, Hamciuc-I and Korshak taken alone or together cannot render obvious the claimed invention, because even if they are considered together they do not teach each and every element of the claimed invention.

Hamciuc-II and Korshak

Hamciuc-II teaches a polymer produced by the reaction of a dimethylsilane dianhydride with a diamine having the formula



to produce a polymer having a residue of a tetracarboxylic acid (*e.g.*, a residue of dimethylsilane dianhydride).

Korshak teaches a polymer produced by the reaction of a dicarboxylic diacid chloride with a diamine having the formula

wherein Ar can be a benzyl ring and Y can be a direct bond. The diamine taught by Korshak differs from that taught by Hamciuc-II in at least two ways: (1) it lacks the two additional aryl ether units and (2) the relative positions of the quinoxalines are different so that the positioning of the phenyl (Ph) substituents of the quinoxalines is different in the polymer product.

Despite the differences in the diamines and the polymerization reactions (diamine+ dicarboxylic diacid chloride vs. diamine+dimethylsilane dianhydride) taught by Korshak and Hamciuc-II, respectively, it is alleged that it would have been obvious to one of ordinary skill in the art to substitute a structural isomer (which is not taught by Korshak) of Korshak's diamine for the diamine taught by Hamciuc-II which is reacted with a dianhydride.

It is stated in the Office Action that "it would have been obvious to a person of ordinary skills in the art to use Korshak's diamine in Hamciuc's copolyimide in order to achieve higher modulus, tensile strength and broader temperature range, which is useful for the applications at elevated temperatures." It is further stated in the Office Action that the Ph-O links provided by the aryl ether units in Hamciuc's diamine provide more mobility in the molecule and that one of skill in the art would recognize that by removing the aryl ether groups (as in Korshak's diamine) it will result in a polymer product having a "higher modulus, tensile strength and broader temperature range."

However, contrary to the assertion in the Office Action, it could not have been obvious to one of skill in the art based on the teachings of Korshak that a polymer produced using a diamine without aryl ether units would have higher modulus, tensile strength and broader

temperature range than a polymer produced in the same way using a diamine with two additional aryl ether units.

The difference between polymers 2 and 11 disclosed in Table 2 at page 215 of Korshak is that polymer 2 contains two additional aryl ether units in its diamine (similar to Hamciuc's diamine) that are not present in polymer 11. However, polymer 11 has a lower tensile strength than polymer 2 (800 kp/cm^2 vs. 1000 kp/cm^2), a lower elongation value (11.5% vs. 15.0%), only a modest increase in glass transition temperature (275°C vs. 300°C) and very similar tensile moduli (0.65 GPa to 0.68 GPa). Korshak's experimental data contradicts the Examiner's assertion that one of skill in the art would have been motivated to use a diamine taught by Korshak in the method taught by Hamciuc-II in order to produce a polymer having a higher tensile strength and elongation modulus.

Further, it is alleged that use of a structural analog of the diamine taught by Korshak in the method taught by Hamciuc-II would have been obvious. However, Korshak specifically teaches the use of two synthesis schemes to produce diamines for reaction with dicarboxylic diacid chlorides to produce polymer products, and neither of these synthesis schemes provides a diamine structure of the claimed invention, although the two synthesis schemes do provide for phenyl substituents of the quinoxaline groups to be positioned differently relative to one another. Thus, Korshak does not teach diamines used in the claimed invention and, in fact, teaches polymerization using only specific structural isomers synthesized using schemes that do not produce the claimed diamines.

Thus, one of skill in the art would not have been motivated to combine the teachings of Korshak and Hamciuc-II to arrive at the claimed invention, as suggested in the Office Action.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Richard Gallagher, Reg. No. 28,781, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

Dated: JUN 21 2010

Respectfully submitted,

By _____
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